

REMARKS/ARGUMENTS

Claim Amendments

The Applicant has amended independent claims 1, 22 and 36. Applicant respectfully submits no new matter has been added. Accordingly, claims 1-31 and 33-46 are pending in the application. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

Claim Rejections – 35 U.S.C. § 112

Claims 1, 22 and 36 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter as the invention.

The Applicant appreciates the Examiner's close scrutiny of the Specification. Though the non-provisional application lacks an explicit description, the provisional application did include subject matter regarding the Applicant's use of the term "simultaneously" in the independent claims. The paragraph beginning on page 39, line 14 and claims 1, 22 and 36 of the specification of the non-provisional application have been amended to include language from the provisional application (60/241,539) equivalent to the term "simultaneously. The phrase "at the same time", which is supported by the text found in the provisional application (page 39, courtesy attachment) has been substituted for the term "simultaneously. The Applicant respectfully requests the withdrawal of the rejection of claims 1, 22 and 36.

Response to Arguments

A. The Applicant has amended the specification with language from the provisional to provide support for the Applicant's claim that the claim language is supported by the Specification.

B. The Applicant has also amended the independent claims to remove the "without communication content" so as to distinguish from Lee.

Claim Rejections – 35 U.S.C. § 103 (a)

Claims 1-31 and 33-46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee (US 6,539,225 B1) in view of Tiedemann, Jr. et al. (US 5,870,427 A) and C. E. Perkins et al. "Route Optimization in Mobile IP", draft-ietf-mobileip-optim-08.txt (Feb. 25 1999). The Applicant respectfully traverses the rejection of these claims.

Independent claims 1, 22 and 36, as amended, now recite that the two registration reply messages are issued 'at the same time' to both the old sub-network router and the new sub-network router. As previously noted, the Applicant submits that even though the Lee reference discloses a seamless handoff; Lee accomplishes a seamless handoff in a distinctly different manner from the Applicant's claimed invention. Lee utilizes simultaneous bindings (i.e., copies of the same packet are sent to two receiving access routers) to insure that data is not lost during the transition from one sub-network router to another sub-network router (see Lee, column 5, lines 43-47).

In the Lee reference an RR message is sent first. Then the multi-route (bi-casting) tunneling continues as long as necessary to ensure that the handoff procedure has completed. The Old Foreign Agent is then de-registered by the home agent (see column 6, line 1-2). Specifically, Lee discloses bi-casting data by sending the data to the old sub-network router and sending duplicate data to the new sub-network router. Thus, Lee requires duplication of content to complete the seamless transfer and a higher communication bandwidth from the network supporting the handoff process is required (not required in the Applicant's present invention).

The Applicant's claimed invention discloses sending reply messages, at the same time, to the old and new sub-network routers (conserving bandwidth). The seamless handoff described by the Applicant is accomplished by sending just one content, carried by old care-of address data packets (data packets that use as a destination address the old care-of address), and synchronizing the nodes using either the De-Registration Reply (DRR). Thus the content is not duplicated, but is first sent to the old care-of address.

The Examiner cites Lee as implicitly teaching use of the de-registration reply message to synchronize a transfer of old care-of address data packets from the old sub-network to the mobile node: "[W]hen handoff of the mobile wireless node 14 actually occurs in the mobile wireless system, the communication content from the home agent 26 is immediately available at the new BSS 24." (Col. 5, lines 53-56). The Applicant has reviewed the cited portion of the Lee reference and respectfully disagrees with the interpretation.

The seamless handoff in Lee is provided by duplicating the content and sending the two copies, one copy to the old sub-network router and the other copy to the new sub-network router. This makes bi-casting necessary and increases the need for more bandwidth. The present invention accomplishes seamless handoff by sending one content via old care-of data packets and synchronizing the nodes using the DRR.

The Tiedemann reference discloses performing a preliminary time alignment in analog before performing a handoff between analog mode and digital mode. The Applicant does not perform a preliminary time alignment as described in Tiedemann.

The Perkins reference is cited for notifying a mobile node that a connection with an old sub-network router will be discarded and then issuing a reply message from a new sub-network router that a new care-of address binding has been created. However, Perkins fails to disclose the limitation of sending one content via old care-of address data packets and synchronizing the nodes using the DRR.

The Applicant respectfully submits that the Lee, Tiedemann and Perkins references do not teach, individually or in combination, the limitations of sending two messages at the same time to the mobile node, sending one content via old care-of address data packets and synchronizing the nodes using the DRR. This being the case, the Applicant respectfully requests the withdrawal of the rejection of claims 1.

Applicants respectfully submit that the method of handing off a mobile node between old and new sub-network routers in an IP based wireless network as disclosed and claimed by the present application is not rendered obvious by any of the cited references, either individually or in combination. This being the case the Applicant respectfully requests the withdrawal of the rejection of claim 1.

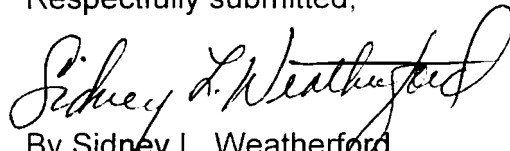
The above limitations are recited in Applicant's claim 1 and analogous limitations are recited in claims 22 and 36. Thus, claims 1, 22 and 36 and all claims dependent therefrom are distinguishable from the Lee, Perkins and Tiedemann references.

CONCLUSION

In view of the foregoing remarks, the Applicant believes all of the claims currently pending in the Application to be in a condition for allowance. The Applicant, therefore, respectfully requests that the Examiner withdraw all rejections and issue a Notice of Allowance for all pending claims.

The Applicant requests a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,


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- ✓ Step_2: *This operational step is a new proposal.* The MN sends a BU directly to the "old" (or "previous") FA to create a "new" binding cache for its "old" Care-of Address with its "new" Care-of Address. In this way the "old" (or "previous") FA will not send the stored user data packets to the "old" Care of Address but it will tunnel all the packets that were stored and/or arriving at the "old" Care-of Address of the MN to the "new" Care-of Address, i.e., to the "new" FA.
- ✓ Step_3: *This operational step is defined in [PeJo00].* The "old" FA after accepting this BU request (see also [PeJo00]) it will create this "new" binding cache that binds the MN's "old" Care-of Address with the MN's "new" Care-of Address. The "old" FA will have to notify the MN about the creation of this new binding cache and therefore it will send a BA to the "new" FA.
- Phase 4: *This operational phase is defined in [PeJo00].* The fourth phase (see Figure 4-13) is activated at the moment that the MN is switching to the "new" wireless access network. During this phase the CN is still receiving upstream packets from the "old" FA. Furthermore the CN is sending downstream user data packets to the "old" FA. During the fourth phase the following subsequent steps have to be fulfilled:
 - ✓ Step_1: The MN is switching from the "old" wireless access network to the "new" wireless access network.
 - ✓ Step_2: The "new" FA sends the BA to the MN via the "new" wireless access network.
 - ✓ Step_3: The "old" FA is forwarding the user data packets sent from the "old" Care-of Address to the "new" Care-of Address via the "new" FA.
 - ✓ Step_4: The forwarded packets received by the "new" FA are sent to the MN. In this way, the **seamless handoff** issue described in Section 3.3 is solved, i.e., the seamless handoff is achieved, since the packets sent between CN and MN are not lost.
- Phase 5: *This operational phase is a new proposal.* The fifth phase (see Figure 4-14) is activated at the moment that the HA is willing to send the Request Reply message to the MN. The CN is still receiving upstream packets from the "old" FA. During the fifth phase the following subsequent steps have to be fulfilled:
 - ✓ Step_1: Once the HA received the RQ message from the MN, the HA must create the new binding and send one Registration Reply (RR) message to the MN. This RR must be sent to the new Care-of Address via the "new" FA that will notify the MN that the new binding has been created. ~~(At the same time the HA is sending a BU to the CN that requests from it to create a "new" binding for the MN. This "new" binding will relate the "new" Care-of Address with the MN's home address.~~